

WHAT IS CLAIMED IS:

1. A concrete mixing truck for transporting concrete from one location to another comprising:
 3. a chassis including: a frame, wheels coupled to the frame, a first power source coupled to the frame, and a first drivetrain coupling the first power source and the wheels;
 6. a second drivetrain coupled to a second power source; and
 7. a mixing drum coupled to the frame and to the second drivetrain, the drum comprising:
 9. a wall including an inner surface defining a volume and an outer surface; and
 11. at least one formation integrally formed as a single unitary body with at least a portion of the wall and extending from the inner surface of the wall, the formation including a tapered base region proximate the inner surface of the wall.
1. 2. The concrete mixing truck of claim 1, wherein the first power source and the second power source are the same power source.
1. 3. The concrete mixing truck of claim 1, wherein the width of the tapered base region decreases as the base region extends further from the inner surface of the wall.
1. 4. The concrete mixing truck of claim 1, wherein the width of the tapered base region proximate the inner surface of the wall is approximately six inches.
1. 5. The concrete mixing truck of claim 1, wherein the tapered base region extends approximately five inches from the inner surface of the wall.
1. 6. The concrete mixing truck of claim 1, wherein the taper of the base region is radiused.

1 7. The concrete mixing truck of claim 6, wherein the radius of the
2 taper is constant.

1 8. The concrete mixing truck of claim 6, wherein the radius of the
2 taper is no less than 10 mm.

1 9. The concrete mixing truck of claim 1, wherein the formation
2 further comprises an intermediate region and an end region.

1 10. The concrete mixing truck of claim 9, wherein a support member
2 is embedded within the end region of the formation.

1 11. The concrete mixing truck of claim 10, further comprising at least
2 one spacer embedded within the end region.

1 12. The concrete mixing truck of claim 11, wherein the at least one
2 spacer resiliently engages the support member.

1 13. The concrete mixing truck of claim 1, wherein the inner surface of
2 the wall includes a seam.

1 14. The concrete mixing truck of claim 13, further comprising a first
2 ramp extending from the inner surface of the wall proximate the seam.

1 15. The concrete mixing truck of claim 1, wherein the formation and
2 the wall are integrally formed as part of a single unitary body.

1 16. The concrete mixing truck of claim 1, further comprising a drive
2 ring coupled to the wall.

1 17. The concrete mixing truck of claim 1, wherein the wall includes an
2 opening.

1 18. The concrete mixing truck of claim 17, wherein the drum includes
2 a hatch cover releasably coupled to the opening.

1 19. The concrete mixing truck of claim 18, wherein the hatch cover
2 includes a first panel on a first side of the opening and a second panel on a
3 second side of the opening, and wherein the first panel is coupled to the
4 second panel.

1 20. A heavy duty rotary concrete mixing drum for coupling to a
2 vehicle having a powered drivetrain for rotating the drum, the drum comprising:
3 a wall including an inner surface defining a volume; and
4 at least one projection integrally formed as a single unitary body
5 with the wall and extending from the inner surface of the wall, the projection
6 including a tapered base region proximate the inner surface of the wall.

1 21. The mixing drum of claim 20, wherein the projection and the wall
2 are integrally formed as part of a single unitary body.

1 22. The mixing drum of claim 20, wherein the width of the tapered
2 base region decreases as the base region extends further from the inner
3 surface of the wall.

1 23. The mixing drum of claim 20, wherein the tapered base region
2 extends approximately five inches from the inner surface of the wall.

1 24. The mixing drum of claim 20, wherein the width of the tapered
2 base region proximate the inner surface of the wall is approximately six inches.

1 25. The mixing drum of claim 20, wherein the taper of the base region
2 is radiused.

1 26. The mixing drum of claim 25, wherein the radius of the taper is
2 constant.

1 27. The mixing drum of claim 25, wherein the radius of the taper is no
2 less than 10 mm.

1 28. The mixing drum of claim 20, wherein the projection further
2 comprises an intermediate region and an end region.

1 29. The mixing drum of claim 28, further comprising a support
2 member embedded within the end region of the projection.

1 30. The mixing drum of claim 29, wherein the support member is
2 torsionally flexible.

1 31. The mixing drum of claim 29, further comprising a plurality of
2 spacers embedded within the end region, each spacer substantially surrounding
3 the support member.

1 32. The mixing drum of claim 31, wherein each spacer includes an
2 outside diameter and an inside diameter when the spacer is wrapped around
3 the support member.

1 33. The mixing drum of claim 32, wherein at least a portion of the
2 outside diameter of each spacer lies on the surface of the formation.

1 34. The mixing drum of claim 20, wherein the formation extends
2 around the inner surface of the wall in the form of an archimedian spiral.

1 35. The mixing drum of claim 20, wherein the wall comprises an inner
2 layer and an outer layer.

1 36. The mixing drum of claim 35, wherein the first layer is an
2 elastomeric material.

1 37. The mixing drum of claim 36, wherein the outer layer is a fiber
2 reinforced composite material.

1 38. The mixing drum of claim 37, wherein the formation is integrally-
2 formed with the inner layer.

1 39. The mixing drum of claim 20, wherein the wall includes a seam.

1 40. The mixing drum of claim 39 further comprising at least one ramp
2 extending from the inner surface of the drum proximate the seam.

1 41. The mixing drum of claim 20, wherein the wall includes an
2 opening.

1 42. The mixing drum of claim 41, further comprising a hatch cover
2 releasably coupled to the opening in the wall.

1 43. The mixing drum of claim 20, further comprising a drive ring
2 coupled to the wall, the drive ring being configured to couple to the powered
3 drivetrain of the vehicle.

1 44. The mixing drum of claim 43, wherein the drive ring comprises a
2 hub configured to be coupled to the powered drivetrain of a vehicle and a
3 plurality of hollow extensions extending radially outwardly from the periphery
4 of the drive ring into the wall of the drum.

1 45. A heavy duty rotary concrete mixing drum for coupling to a
2 vehicle having a powered drivetrain for rotating the drum, the drum comprising:
3 a wall including an inner layer and an outer layer, the inner layer
4 including a first section and a second section, at least one of the first section
5 and the second section extending from an axial end of the drum across an axial
6 midpoint of the drum, each of the first section and the second section having
7 an inner surface; and
8 a first projection coupled to the inner layer of the first section and
9 extending from the inner surface of the first section, the projection including a
10 tapered base region proximate the inner surface of the first section.

1 46. The mixing drum of claim 45, wherein the tapered base region is
2 radiused.

1 47. The mixing drum of claim 46, wherein the first projection extends
2 around the inner surface of the first section in the form of an archimedian
3 spiral.

1 48. The mixing drum of claim 47, wherein the inner layer is an
2 elastomeric material.

1 49. The mixing drum of claim 48, wherein the outer layer is a fiber
2 reinforced composite material.

1 50. The mixing drum of claim 45, wherein the first projection and the
2 first section are integrally-formed as part of a single unitary body.

1 51. The mixing drum of claim 45, wherein a seam is formed between
2 the first section and the second section.

1 52. The mixing drum of claim 51, wherein the first section includes a
2 ramp extending from the inner surface of the first section proximate the seam.

1 53. The mixing drum of claim 52, wherein the second section includes
2 a ramp extending from the inner surface of the section proximate the seam.

1 54. The mixing drum of claim 52, further comprising a second
2 projection coupled to the second section.

1 55. A spiraling formation for use within a heavy duty, rotary concrete
2 mixing drum capable of attachment to a vehicle, the formation comprising a
3 body configured to extend inwardly from an inner wall of the drum, the body
4 having a base portion and a free end, the base portion including at least one
5 tapered surface, the formation being of a length configured to spirally extend
6 from an axial end of the drum across an axial midpoint of the drum.

1 56. The formation of claim 55, wherein the body is formed from at
2 least one polymeric material.

1 57. The formation of claim 55, wherein the greatest width of the
2 tapered base portion is approximately six inches.

1 58. The formation of claim 57, wherein the greatest height of the
2 tapered base portion has a maximum height of approximately five inches.

1 59. The formation of claim 55, wherein the width of the tapered base
2 region decreases as the base region extends further from the inner surface of
3 the wall.

1 60. The formation of claim 55, wherein the at least one tapered
2 surface of the base portion is radiused.

1 61. The formation of claim 60, wherein the radius of the at least one
2 tapered surface is constant.

1 62. The formation of claim 60, wherein the radius of the taper is no
2 less than 10 mm.

1 63. The formation of claim 55, wherein the formation further
2 comprises an intermediate region and an end region.

1 64. The formation of claim 63, wherein a support member is
2 embedded within the end region of the formation.

1 65. The formation of claim 64, further comprising at least one spacer
2 embedded within the end region.

1 66. The formation of claim 65, wherein the at least one spacer
2 resiliently engages the support member.

3 67. The formation of claim 56, wherein the body has a midportion
4 between the base portion and the free end formed entirely from one or more
5 layers formed substantially from at least one non-metallic material.